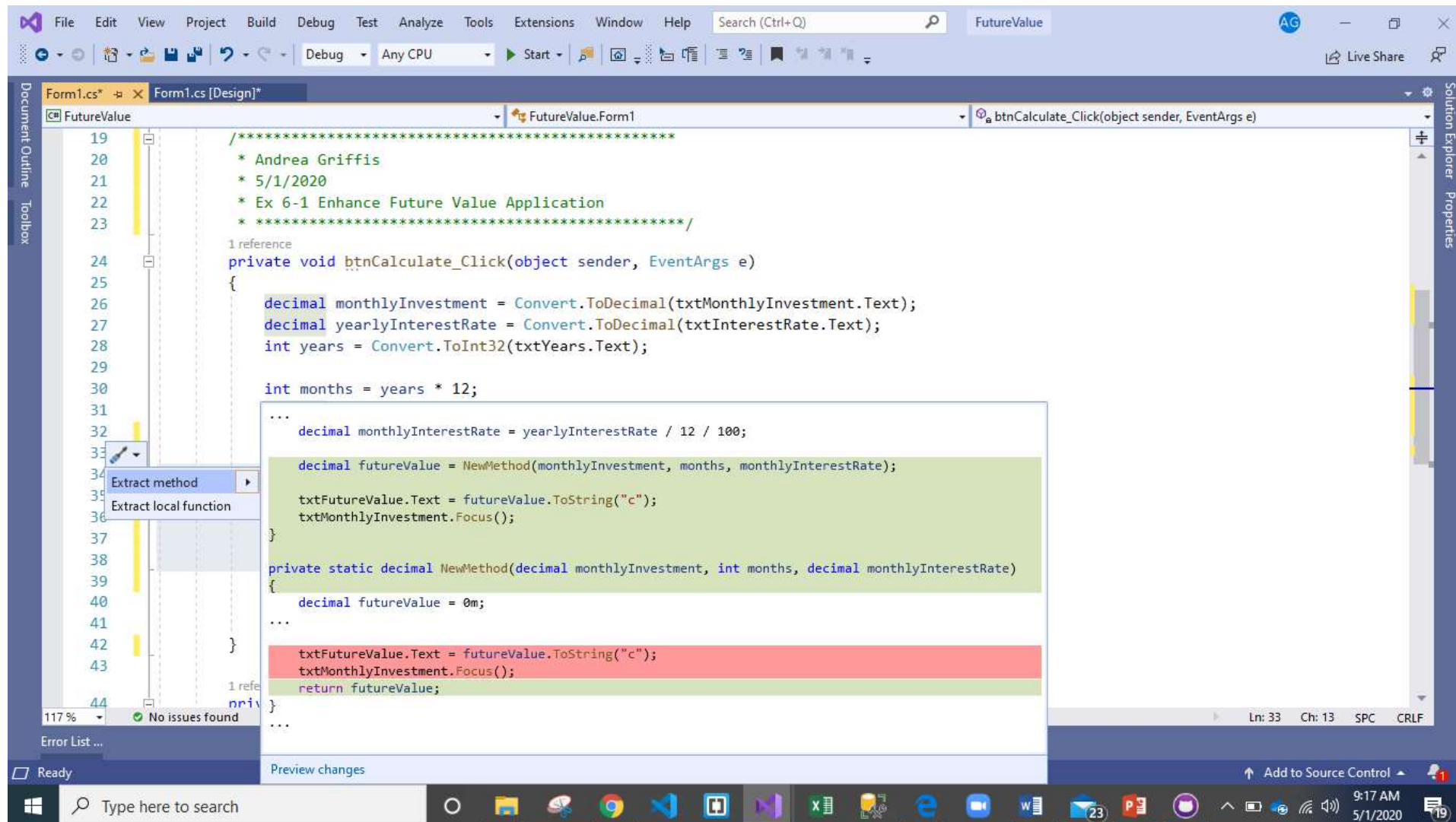


Assignment: Week 4 Murach Practice Assignments (Individual)

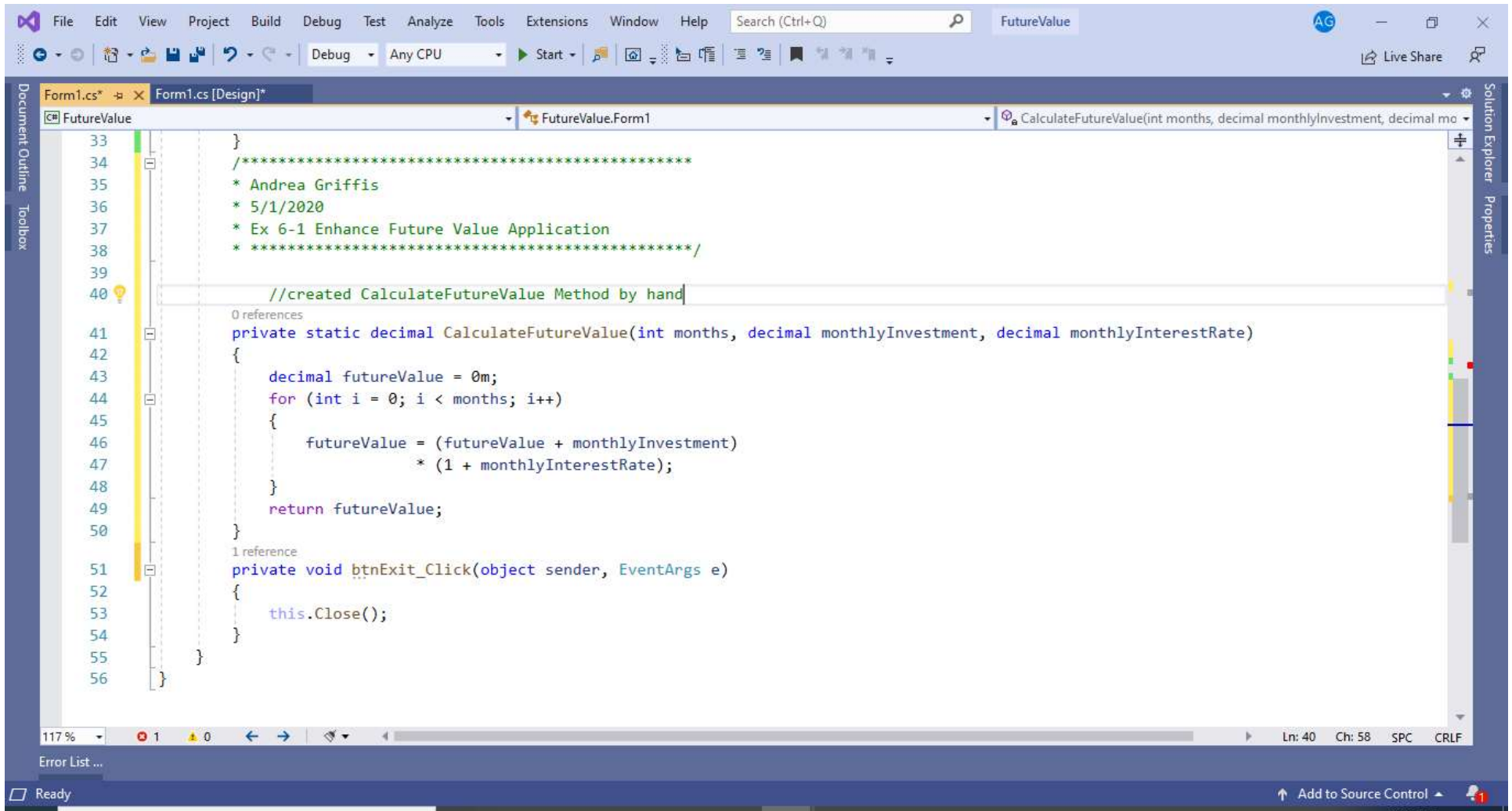
Github URL : <https://github.com/AGriffis5814/FutureValue.git>

Ex 6-1 Enhance the Future Value (1-13)

Use Refactoring (#1-3)



Add the CalculateFutureValue method without using refactoring (4-7)
(#4&5)



The screenshot shows the Visual Studio IDE with the following details:

- Menu Bar:** File, Edit, View, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, Help.
- Search Bar:** Search (Ctrl+Q)
- Toolbar:** Includes icons for Run, Stop, Break, and other development actions.
- Document Outline:** Shows the project structure with 'Form1.cs' and 'Form1.cs [Design]*'.
- Code Editor:** Displays the source code for 'FutureValue.Form1'. The code includes a comment block with author information and a new method implementation.

```
33     }
34     /*****
35     * Andrea Griffis
36     * 5/1/2020
37     * Ex 6-1 Enhance Future Value Application
38     * *****/
39
40     //created CalculateFutureValue Method by hand
41
42     0 references
43     private static decimal CalculateFutureValue(int months, decimal monthlyInvestment, decimal monthlyInterestRate)
44     {
45         decimal futureValue = 0m;
46         for (int i = 0; i < months; i++)
47         {
48             futureValue = (futureValue + monthlyInvestment)
49                 * (1 + monthlyInterestRate);
50         }
51         return futureValue;
52     }
53
54     1 reference
55     private void btnExit_Click(object sender, EventArgs e)
56     {
57         this.Close();
58     }
59 }
```
- Properties Window:** Visible on the right side of the IDE.
- Status Bar:** Shows 'Ready' and 'Add to Source Control'.

(#6&7)

The screenshot displays the Visual Studio IDE with a C# project named 'FutureValue'. The main window shows the code for 'Form1.cs [Design]*'. The code is as follows:

```
19  /*****  
20  * Andrea Griffis  
21  * 5/1/2020  
22  * Ex 6-1 Enhance Future Value Application  
23  * *****/  
24  1 reference  
25  private void btnCalculate_Click(object sender, EventArgs e)  
26  {  
27      decimal monthlyInvestment = Convert.ToDecimal(txtMonthlyInvestment.Text);  
28      decimal yearlyInterestRate = Convert.ToDecimal(txtInterestRate.Text);  
29      int years = Convert.ToInt32(txtYears.Text);  
30      int months = years * 12;  
31      decimal monthlyInterestRate = yearlyInterestRate / 12 / 100;  
32      // Modified the code so it calls for the new method CalculateFuture Value  
33      decimal futureValue = CalCulateFutureValue(monthlyInvestment, months, monthlyInterestRate);  
34      txtFutureValue.Text = futureValue.ToString("c");  
35      txtMonthlyInvestment.Focus();  
36  }  
37  1 reference  
38  private static decimal CalCulateFutureValue(decimal monthlyInvestment, int months, decimal month  
39  {  
40      decimal futureValue = 0m;  
41  }
```

The Solution Explorer on the right shows the project structure:

- Solution 'FutureValue' (1 of 1 project)
 - FutureValue
 - Properties
 - References
 - app.config
 - Form1.cs
 - Program.cs

The status bar at the bottom indicates '129 %', 'No issues found', and 'Ln: 32 Ch: 86 SPC CRLF'. The bottom-most bar shows 'Ready' and 'Add to Source Control'.

Visual Studio interface showing the development of a C# application for calculating future value.

Code Editor (Form1.cs):

```
21 {
22     decimal monthlyInvestment = Convert.ToDecimal(txtMonthlyInvestment.Text);
23     decimal yearlyInterestRate = Convert.ToDecimal(txtInterestRate.Text);
24     int years = Convert.ToInt32(txtYears.Text);
25
26     int months = years * 12;
27     decimal monthlyInterestRate = yearlyInterestRate / 12 / 100;
28
29     // modified click event code so it calls for the new CalculateFutureValue method
30     txtFutureValue.Text = CalculateFutureValue(months,monthlyInvestment, monthlyInterestRate).ToString("c");
31     txtMonthlyInvestment.Focus();
32 }
33
34
35
36 // created CalculateFutureValue Method by hand
37 private static decimal CalculateFutureValue(int months, decimal monthlyInvestment, decimal monthlyInterestRate)
38 {
39     decimal futureValue = 0m;
40     for (int i = 0; i < months; i++)
41     {
42         futureValue = (futureValue + monthlyInvestment)
43             * (1 + monthlyInterestRate);
44     }
45     return futureValue;
46 }
47 private void btnExit_Click(object sender, EventArgs e)
48 {
49     this.Close();
50 }
51 }
```

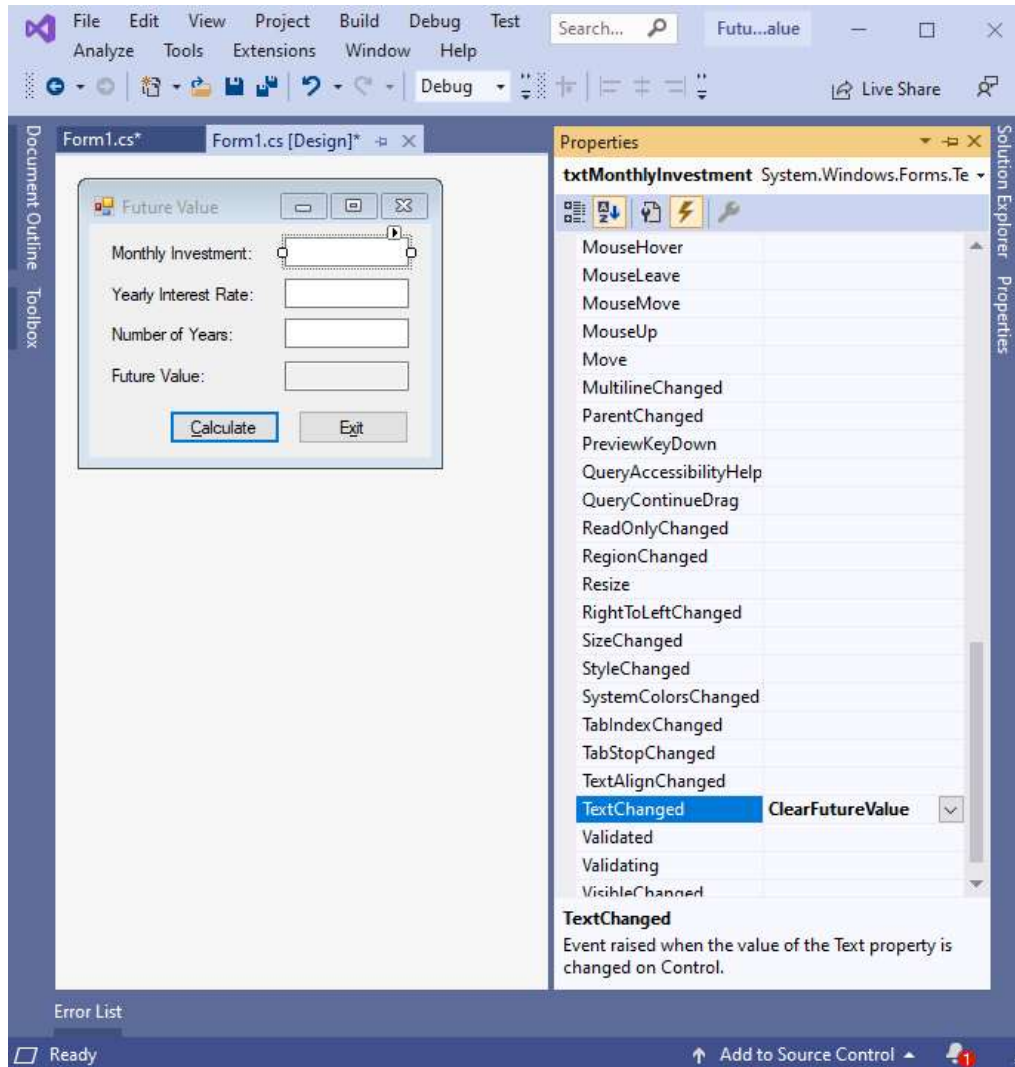
Future Value Calculator Dialog Box:

Field	Value
Monthly Investment:	100
Yearly Interest Rate:	12
Number of Years:	1
Future Value:	\$1,280.93

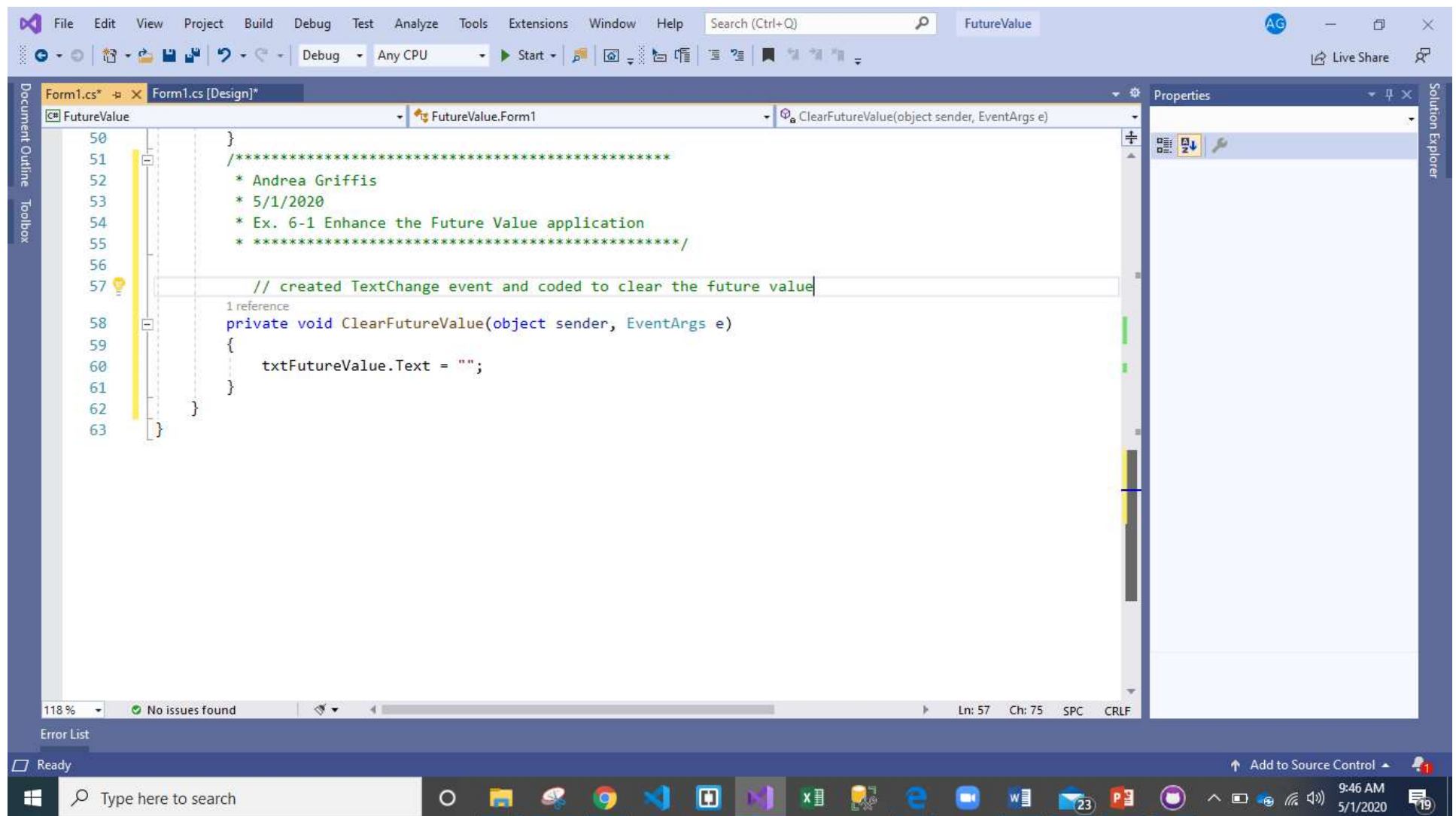
Buttons: Calculate, Exit

Bottom Bar: 97% zoom, No issues found, Call Stack, Exception Settings, Immediate Window, Error List, Locals, Watch 1. System tray shows 9:36 AM, 5/1/2020.

Add an event handler for the TextChange events (8-13)
(8)



(9)



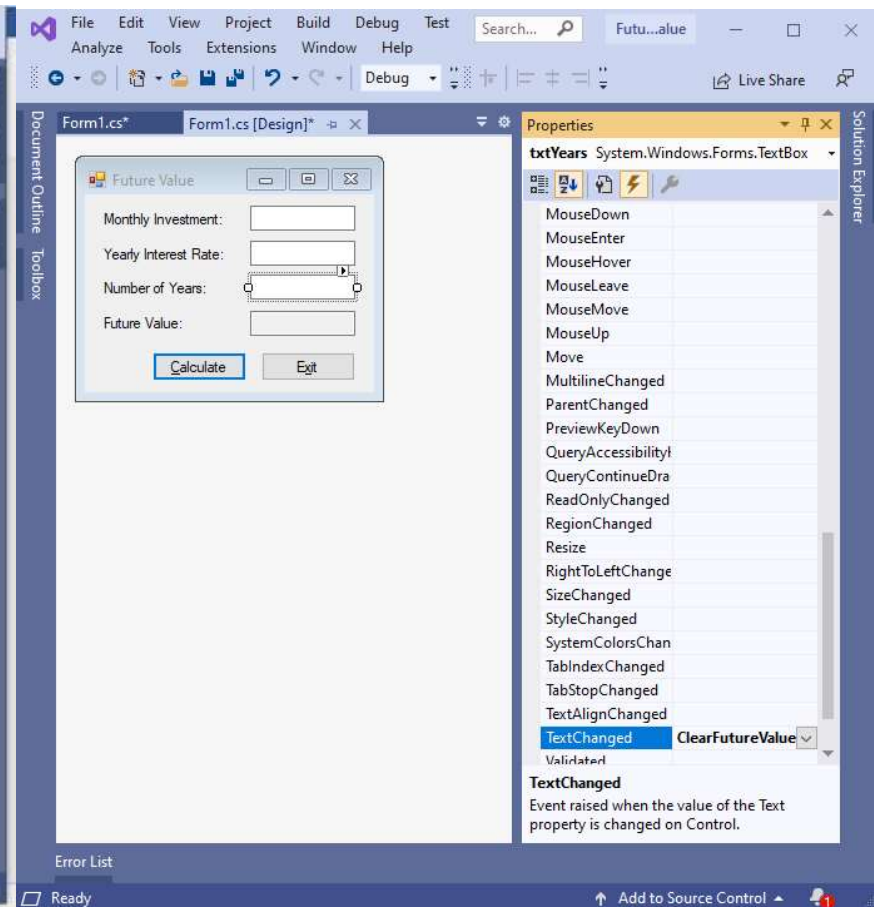
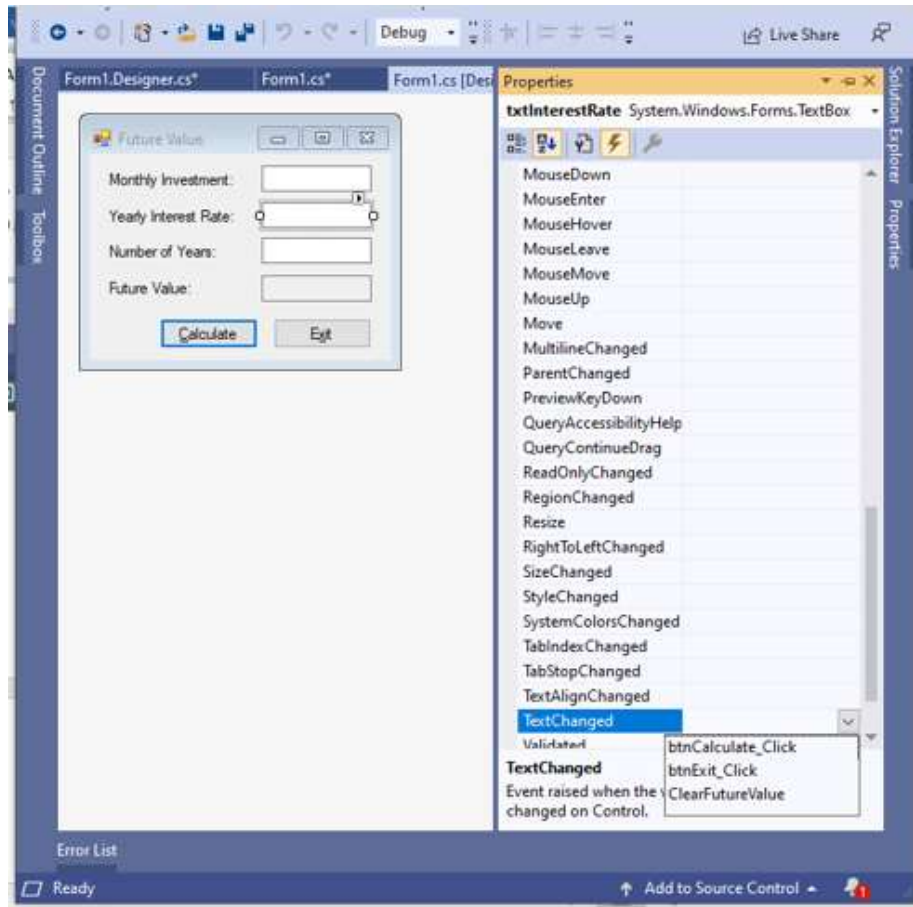
(#10)

The screenshot displays the Visual Studio 2019 IDE with the following components:

- Menu Bar:** File, Edit, View, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, Help.
- Toolbar:** Includes icons for file operations, debugging, and search. The search bar contains "FutureValue".
- Document Outline:** Shows the project structure with "FutureValue" selected.
- Code Editor:** Displays the code for `Form1.cs [Design]*`. The code is as follows:

```
81 this.txtInterestRate.Name = "txtInterestRate";
82 this.txtInterestRate.Size = new System.Drawing.Size(84, 20);
83 this.txtInterestRate.TabIndex = 26;
84 //
85 // txtMonthlyInvestment
86 //
87 this.txtMonthlyInvestment.Location = new System.Drawing.Point(132, 9);
88 this.txtMonthlyInvestment.Name = "txtMonthlyInvestment";
89 this.txtMonthlyInvestment.Size = new System.Drawing.Size(84, 20);
90 this.txtMonthlyInvestment.TabIndex = 25;
91 /*****
92 * Andrea Griffis
93 * 5/1/2020
94 * Ex. 6-1 Enhance the Future Value application
95 * *****/
96 //the code that follows is the statement that wires the Textchange Event
97 this.txtMonthlyInvestment.TextChanged += new System.EventHandler(this.ClearFutureValue);
98 //
99 // label4
100 //
101 this.label4.Location = new System.Drawing.Point(12, 92);
102 this.label4.Name = "label4";
103 this.label4.Size = new System.Drawing.Size(114, 20);
104 this.label4.TabIndex = 24;
105 this.label4.Text = "Future Value:";
106 this.label4.TextAlign = System.Drawing.ContentAlignment.MiddleLeft;
107 //
```
- Properties Window:** Shows the `InitializeComponent()` method.
- Bottom Bar:** Includes the "Error List" (showing "No issues found"), a search bar, and the Windows taskbar.
- Windows Taskbar:** Shows the system clock as 9:53 AM on 5/1/2020, along with icons for various applications including Microsoft SQL Server Management Studio 17.

(11)



(12) FV text clr w/num of yr text box change

Future Val... — □ ×

Monthly Investment: 100

Yearly Interest Rate: 12

Number of Years: |

Future Value:

Calculate Exit

FV text clr w/yrly inv rate text box change

Future Val... — □ ×

Monthly Investment: 100

Yearly Interest Rate: |

Number of Years: 5

Future Value:

Calculate Exit

FV text clr w/mnthly invest text box change

Future Val... — □ ×

Monthly Investment: |

Yearly Interest Rate: 10

Number of Years: 5

Future Value:

Calculate Exit

Ex 6-2 Experiment with events (#1-7)

Generate and delete an event handler (1-3)

The screenshot displays the Visual Studio IDE with the following components:

- Menu Bar:** File, Edit, View, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, Help.
- Search Bar:** Search (Ctrl+Q)
- Toolbar:** Includes buttons for Run, Stop, Break, and other development actions.
- Document Outline:** Shows the project structure with 'FutureValue' and 'FutureValue.Form1'.
- Code Editor:** Displays the code for 'Form1.Designer.cs'. The code includes a 'ClearFutureValue' method and a 'Form1_Load' method.
- Properties Window:** Located on the right, showing the properties of the selected control.
- Bottom Bar:** Shows the status bar with '118 %', 'No issues found', and 'Ln: 70 Ch: 2 SPC CRLF'.

```
50 }
51
52
53 // created TextChange event and coded to clear the future value
54 private void ClearFutureValue(object sender, EventArgs e)
55 {
56     txtFutureValue.Text = "";
57 }
58
59 * Andrea Griffis
60 * 5/1/2020
61 * Ex. 6-2 Experiment with events
62 * *****/
63
64 //double clicked form and generated load event handler
65 private void Form1_Load(object sender, EventArgs e)
66 {
67 }
68 }
69
70 }
```

```
File Edit View Project Build Debug Test Search... Futu...alue
Analyze Tools Extensions Window Help
Form1.cs [Design] Form1.Designer.cs* Form1.cs
FutureValue FutureValue.Form1 InitializeComponent()
144 this.Controls.Add(this.label4);
145 this.Controls.Add(this.label3);
146 this.Controls.Add(this.label2);
147 this.Controls.Add(this.label1);
148 this.Name = "Form1";
149 this.StartPosition = System.Windows.Forms.FormStartPosition
150 this.Text = "Future Value";
151 /*****
152  * Andrea Griffis
153  * 5/1/2020
154  * Ex. 6-2 Experiment with events
155  * *****/
156 //located event wiring for handler
157 this.Load += new System.EventHandler(this.Form1_Load);
158 this.ResumeLayout(false);
159 this.PerformLayout();
160
161 }
162
163 #endregion
164
165 private System.Windows.Forms.TextBox txtFutureValue;
166 private System.Windows.Forms.Button btnExit;
167 private System.Windows.Forms.Button btnCalculate;
168 private System.Windows.Forms.TextBox txtYears;
169 private System.Windows.Forms.TextBox txtInterestRate;
118 % 1 0 Ln: 156 Ch: 47 SPC CRLF
Call Stack Exception Settings Immediate Window Error List Locals Watch 1
Add to Source Control
```

```
File Edit View Project Build Debug Test Search... Futu...alue
Analyze Tools Extensions Window Help
Form1.cs [Design] Form1.Designer.cs* Form1.cs
FutureValue FutureValue.Form1 InitializeComponent()
144 this.Controls.Add(this.label4);
145 this.Controls.Add(this.label3);
146 this.Controls.Add(this.label2);
147 this.Controls.Add(this.label1);
148 this.Name = "Form1";
149 this.StartPosition = System.Windows.Forms.FormStartPosition
150 this.Text = "Future Value";
151 /*****
152  * Andrea Griffis
153  * 5/1/2020
154  * Ex. 6-2 Experiment with events
155  * *****/
156 //deleted event wiring for handler
157
158 this.ResumeLayout(false);
159 this.PerformLayout();
160
161 }
162
163 #endregion
164
165 private System.Windows.Forms.TextBox txtFutureValue;
166 private System.Windows.Forms.Button btnExit;
167 private System.Windows.Forms.Button btnCalculate;
168 private System.Windows.Forms.TextBox txtYears;
169 private System.Windows.Forms.TextBox txtInterestRate;
118 % No issues found Ln: 156 Ch: 22 SPC CRLF
Call Stack Exception Settings Immediate Window Error List Locals Watch 1
Add to Source Control
```

Reran to test (#3)

The screenshot shows the Visual Studio IDE with a C# project named 'FutureValue'. The main window is 'Form1.cs [Design]', showing the 'Form1.Designer.cs' file. The code in the designer file includes:

```
144 this.Controls.Add(this.label4);
145 this.Controls.Add(this.label3);
146 this.Controls.Add(this.label2);
147 this.Controls.Add(this.label1);
148 this.Name = "Form1";
149 this.StartPosition = System.Windows.Forms.FormStartPosition.CenterScreen;
150 this.Text = "Future Value";
151 /*****
152  * Andrea Griffis
153  * 5/1/2020
154  * Ex. 6-2 Experiment with events
155  * *****/
156 //deleted event wiring for handler
157
158 this.ResumeLayout(false);
159 this.PerformLayout();
160
161 }
162
163 #endregion
164
165 private System.Windows.Forms.TextBox txtFutureValue;
166 private System.Windows.Forms.Button btnExit;
167 private System.Windows.Forms.Button btnCalculate;
168 private System.Windows.Forms.TextBox txtYears;
169 private System.Windows.Forms.TextBox txtInterestRate;
170 private System.Windows.Forms.TextBox txtMonthlyInvestment;
```

A modal dialog box titled 'Future Val...' is displayed over the code editor. It contains four text boxes labeled 'Monthly Investment:', 'Yearly Interest Rate:', 'Number of Years:', and 'Future Value:'. Below the text boxes are two buttons: 'Calculate' and 'Exit'.

The bottom status bar shows '118 %', 'No issues found', and 'Ln: 156 Ch: 22 SPC CRLF'. The bottom-most bar shows 'Ready' and 'Add to Source Control'.

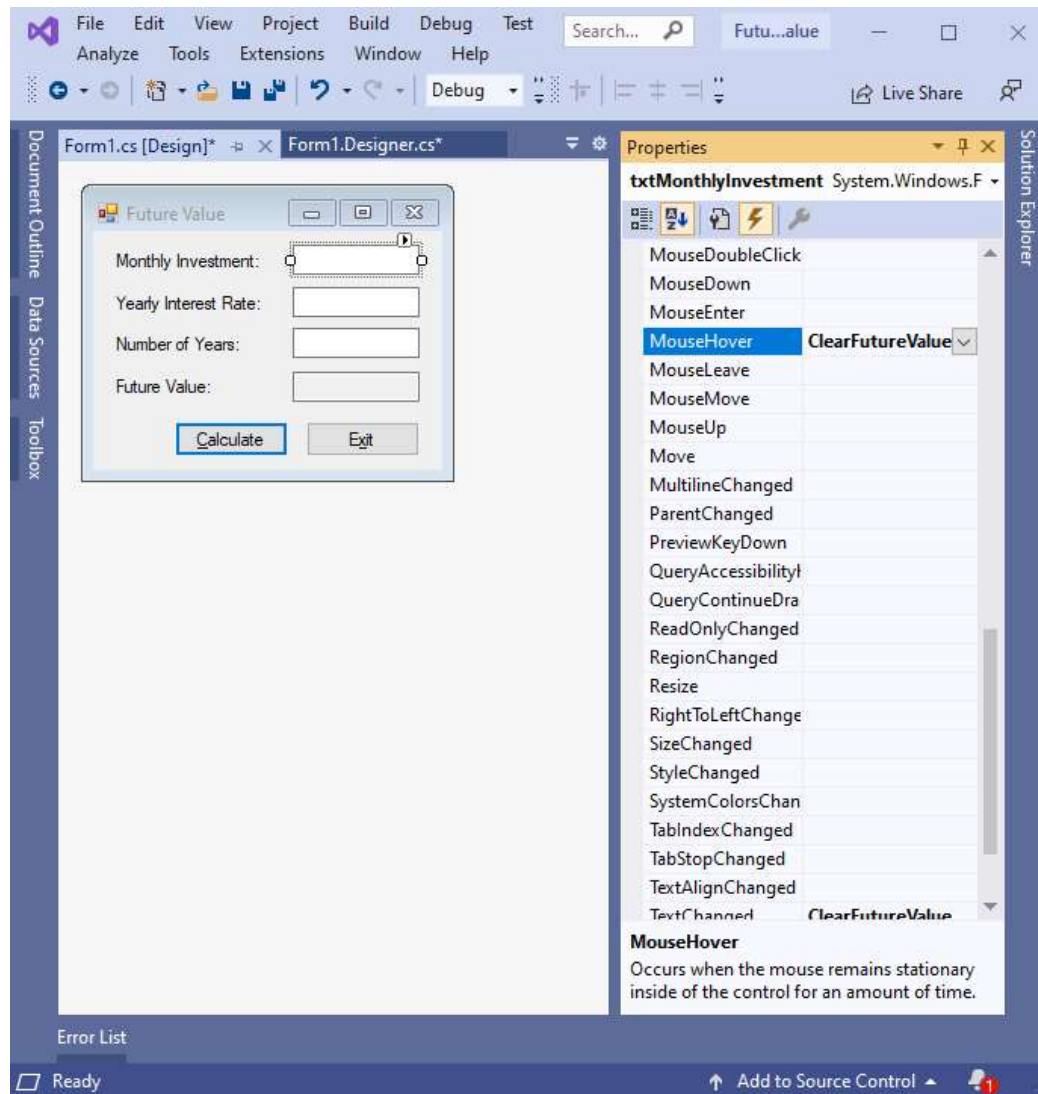
Use a form event and two more control events (4-7)
(4)

Visual Studio interface showing the code for Form1.cs. The code defines two event handlers: ClearFutureValue and Form1_DoubleClick. The ClearFutureValue method sets txtFutureValue.Text to an empty string. The Form1_DoubleClick method sets txtYears.Text, txtMonthlyInvestment.Text, txtInterestRate.Text, and txtFutureValue.Text to empty strings. The code is annotated with comments and a lightbulb icon on line 63.

```
53 // created TextChange event and coded to clear the future value
54 3 references
55 private void ClearFutureValue(object sender, EventArgs e)
56 {
57     txtFutureValue.Text = "";
58 }
59 /*****
60 * Andrea Griffis
61 * 5/1/2020
62 * Ex 6-2 Experiment with event
63 * *****/
64 //created form event handler for double click to clear all text boxes
65 1 reference
66 private void Form1_DoubleClick(object sender, EventArgs e)
67 {
68     txtYears.Text = "";
69     txtMonthlyInvestment.Text = "";
70     txtInterestRate.Text = "";
71     txtFutureValue.Text = "";
72 }
```

Properties window on the right shows the Properties grid. The bottom status bar indicates 142% zoom, No issues found, and the current line is 63, column 79.

(5)



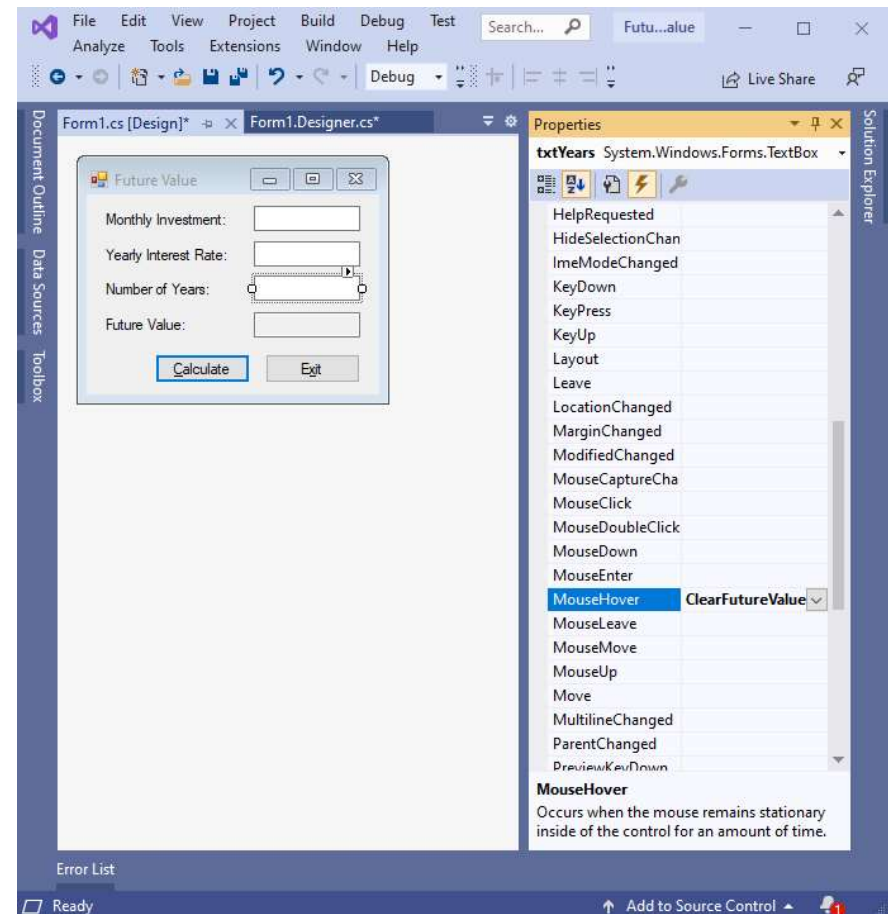
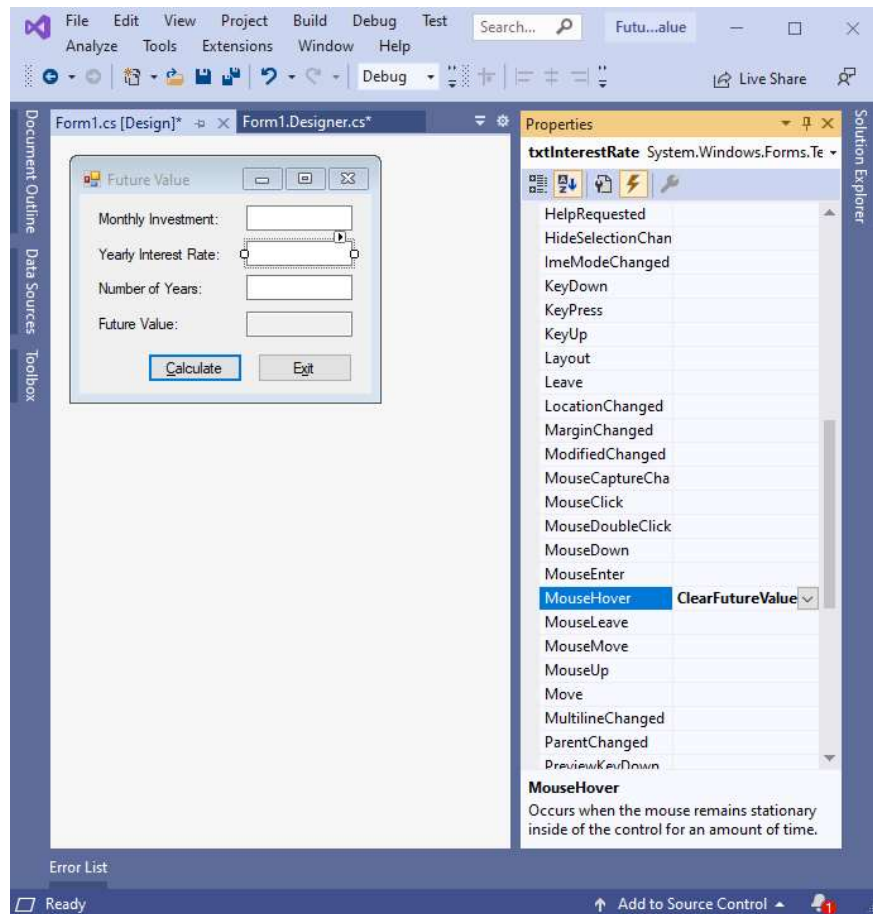
(6)

The screenshot displays the Visual Studio IDE with the following components:

- Menu Bar:** File, Edit, View, Project, Build, Debug, Test, Analyze, Tools, Extensions, Window, Help.
- Search Bar:** Search (Ctrl+Q)
- Toolbox:** Debug, Any CPU, Start, and various development icons.
- Document Outline:** FutureValue, Form1.cs [Design], Form1.Designer.cs, Form1.cs.
- Code Editor:** Contains the following C# code:

```
62 txtYears.Text = "";
63 txtMonthlyInvestment.Text = "";
64 txtInterestRate.Text = "";
65 txtFutureValue.Text = "";
66 }
67 /*****
68  * Andrea Griffis
69  * 5/1/2020
70  * Ex 6-2 Experiment with event
71  * *****/
72 //set interest rate text box to 12 when doubleclicked
73 private void txtInterestRate_DoubleClick(object sender, EventArgs e)
74 {
75     txtInterestRate.Text = "12";
76 }
77 }
78 }
```
- Properties Window:** Empty.
- Solution Explorer:** Empty.
- Status Bar:** 142% zoom, No issues found, Ln: 66, Ch: 10, SPC, CRLF.
- Bottom Bar:** Error List, Item(s) Saved, Add to Source Control.

(7)



Completed calculation

Hover Monthly Invtxt= clr FV

dbl click clr all text boxes